

To: BBXRT Team
From: R. Kelley for the Attitude Controllers
Date: 19 December 1990
Subject: Orientation of Aspect Camera and Detector Pixels

Based on the in-flight use of the aspect camera and the X-ray detectors, we have determined the orientation of the aspect camera and the detectors with respect to the Shuttle coordinate system. In the case of the aspect camera, the orientation was found to be the same as that determined during ground testing in Bldg. 10. For the X-ray detectors, however, the orientation was reversed in a symmetric way that will be described below. This information will be necessary for the many observations where a knowledge of the celestial position of each of the detector pixels is required.

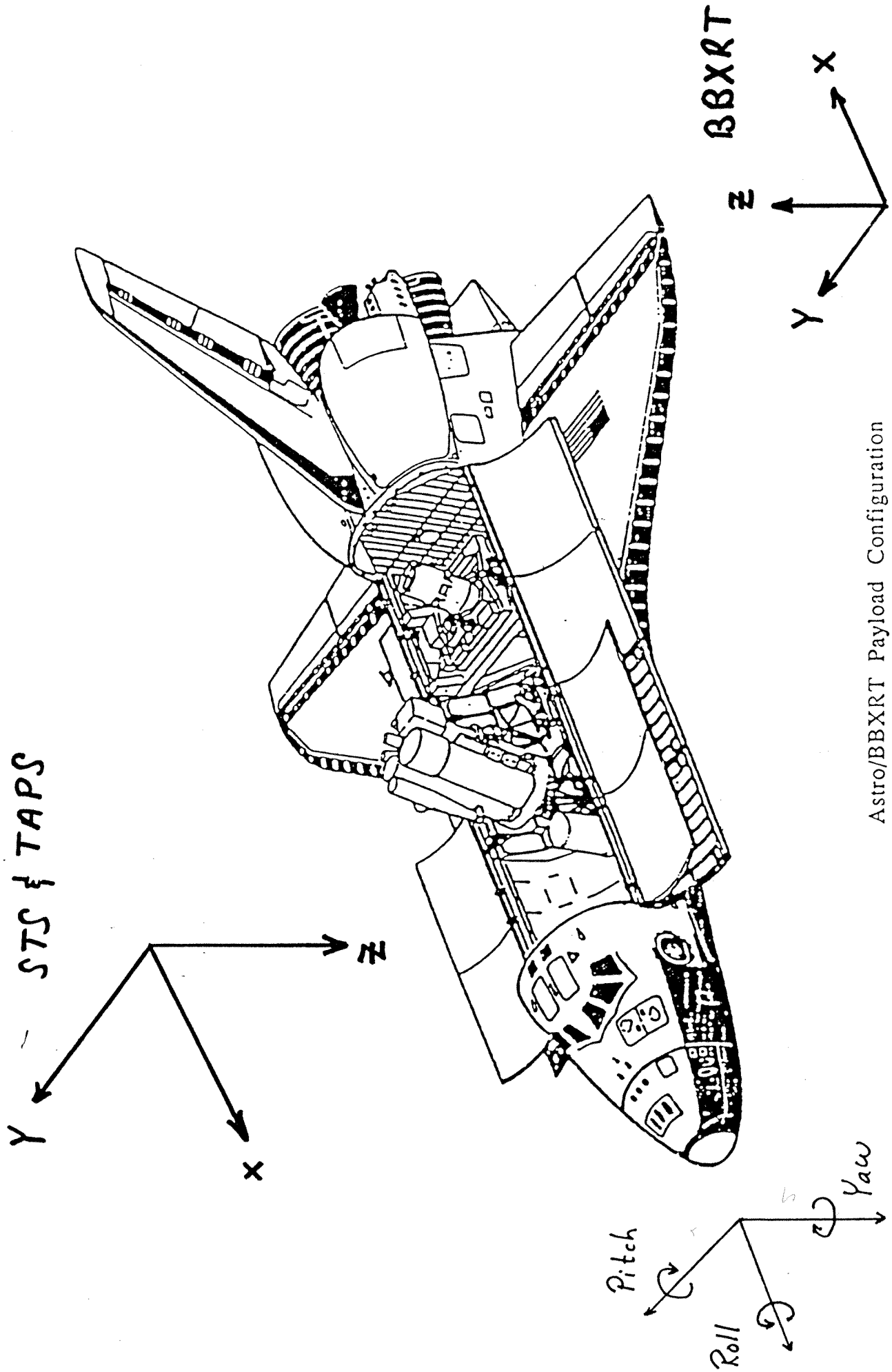
I. Aspect Camera

The orientation of the aspect camera was determined by comparing an aspect solution obtained during the flight with a plot of the expected orientation of the stars in the aspect camera based on a knowledge of the Orbiter orientation (see Figure 1 for the definition of the various coordinate systems employed). This exercise indicates that the left side of the camera field is in the direction of the Orbiter nose (STS-X) and the bottom of the camera is in the direction of the starboard wing (STS-Y) when viewed as if you were looking out from the cargo bay toward the sky (Figure 2). This orientation is the same as that eventually found during ground testing in Bldg. 10. This orientation was verified on numerous occasions during the flight when we "tweaked" the pointing direction based on a camera aspect solution.

II. X-Ray Detectors

Our first attempt at determining the pixel orientation came when we acquired Capella at about MET 2/5:15. This was just before we realized that TAPS had a large uncompensated drift in the ROLL direction. At that time we observed the image of Capella to drift toward the bottom of the camera (i.e., +Y) at about 0.7 arcmin/min, and the X-ray image also drifted in the same "downward" direction on the GSE Rates Page. Since the X-ray mirrors invert the image, the image of Capella should have drifted "up" in the X-ray detectors when it drifted down in the aspect camera. This implies that pixels 2 and 4 on both detectors are reversed with respect to the pre-flight expectation. The assignment of pixels 1 and 3 for both detectors was found to agree with the pre-launch expected configuration. Figure 3 shows what we believe to be the actual *projection* of the detector pixels onto the sky as viewed from the cargo bay if you were lying in the bay with your feet toward the starboard wing. This orientation was also confirmed when we tweaked the pointing direction based on counting rates in the various detector pixels.





Astro/BBXRT Payload Configuration

Figure 1



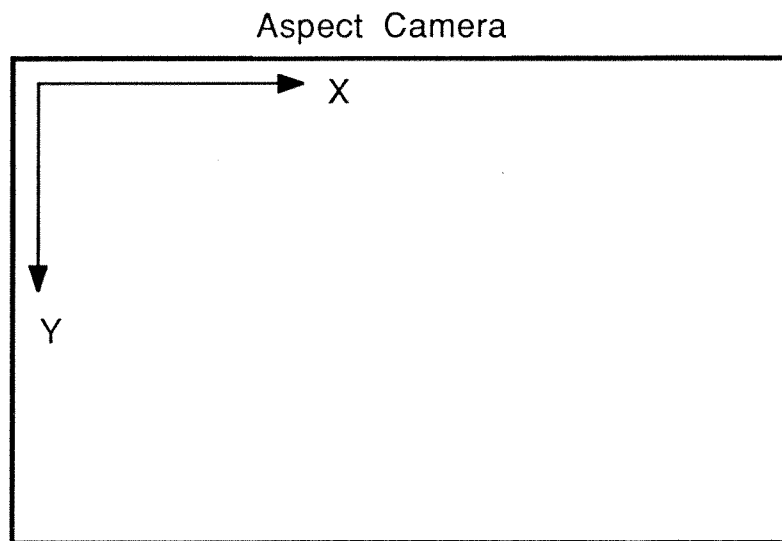
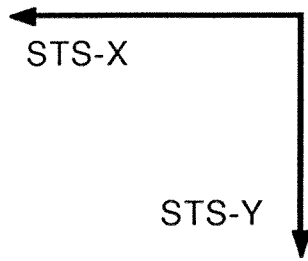


Figure 2



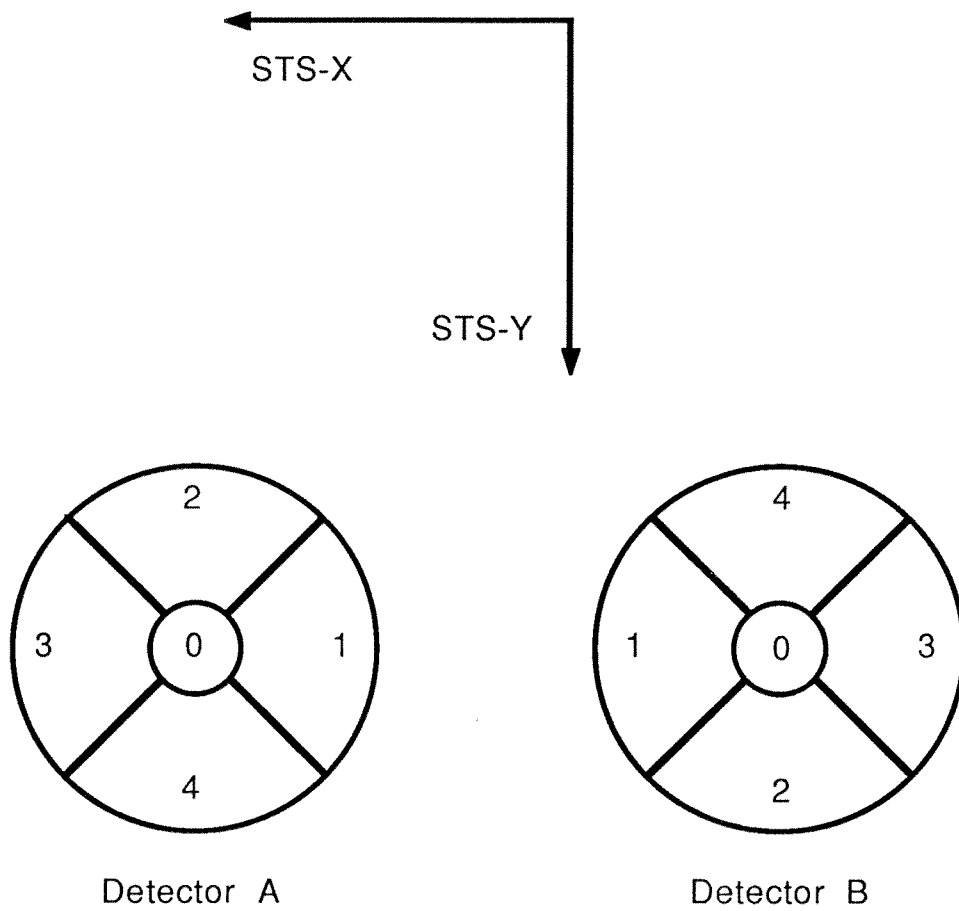


Figure 3

